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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/990,658	11/16/2001	Hiroshi Miyajima	15082	2457

7590 12/01/2003
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EXAMINER

ALLEN, DENISE S

ART UNIT PAPER NUMBER

2872

DATE MAILED: 12/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/990,658

Applicant(s)

MIYAJIMA ET AL.

Examiner

Denise S Allen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 September 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10 and 13-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10 and 13-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 Nov 16 and 03 Apr 10 and 03 Sep 15 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 10.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 15, 2003 has been entered.

Drawings

The proposed drawing corrections were received on September 15, 2003 (paper #11). These drawing corrections are approved by the examiner.

The substitute drawings were received on September 15, 2003 (paper #11). These drawings are acceptable.

Response to Arguments

Applicant's arguments with respect to claims 1 – 8, 10, and 13 – 17 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

Claims 15 – 17 are objected to because of the following informalities: the limitation “the conductive element” (claim 15 line 21) lacks antecedent basis because it has not been previously recited in claim 15. Suggested correction: replace the limitation “the conductive element” with “the coil”. Appropriate correction is required.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 – 4, 6 – 8, 10, and 13 – 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Esashi et al (EP 0 686 863) in view of Minamoto et al (US 6,122,089).

Regarding claims 1 and 15, Esashi et al teaches an optical deflector (Figures 10 – 14) comprising: a mirror structure (reference 2) having a first surface (the side facing reference 4) and a second surface (the side facing reference 3) which are in a front/back relation, the mirror structure comprising a pair of supports (the two sides of reference 2 where references 9A and 9B are located), a movable plate (reference 5) which is moved with respect to the supports (page 10 lines 18 – 20), and a pair of elastic members (reference 6A) for connecting the movable plate and the supports, such that the movable plate is able to rock with respect to the supports about the pair of elastic members as a rocking axis, the supports having a first surface and a second surface (facing references 4 and 3 respectively), which respectively comprise a part of the first surface and a part of the second surface of the mirror structure, the movable plate having a first and a second surface (also facing references 4 and 3 respectively), which respectively comprise a part of the first surface and a part of the second surface of the mirror structure, and the movable plate having a mirror surface on the second surface (reference 8); a single plate base (reference 3) for holding the mirror structure, the mirror structure and the base being individual elements (Figure 14), the base having an opening (reference 3A) for exposing the mirror surface, the base having

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bonding portions projecting from the base (page 10 lines 36 – 38), and the supports of the mirror structure being fixed to the bonding portions of the base by adhesion with the second surfaces of the supports in contact with the bonding portions (page 10 lines 32 – 35), so that the mirror structure is positioned remote from the base; and driving means for driving the mirror structure, the driving means including a conductive element (reference 7A) formed on the second surface of the movable plate, and magnetic field generating elements (references 10A, 10B, 11A, and 11B) fixed on the base, the magnetic field generating elements being disposed on the same side of the base as a side on which the mirror structure is mounted, and the conductive element being positioned so as to overlap the magnetic field generating elements as viewed from a direction parallel to the first and second surface of the mirror structure. Esashi et al does not teach that the conductive element is formed on the first surface of the movable plate.

Minamoto et al teaches an optical deflector (Figures 1 – 3) with a mirror surface (reference 106) formed on a second surface of a movable plate (reference 101) and a conductive element (reference 104) formed on a first surface of the movable plate, where the first and second surfaces have a front/back relation (Figures 2 and 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to move the conducting element of Esashi et al from the same surface as the mirror to the opposite surface as in the optical deflector of Minamoto et al in order to maximize the size of the mirror surface.

Regarding claim 2, Esashi et al teaches the supports include electrode pads (reference 9A) electrically connected to the conductive element. Esashi et al and Minamoto et al do not teach the base includes wiring materials for electric connection to the outside, the wiring material

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have connection portions electrically connected to the electrode pads, and the electrode pads are electrically connected to the connection portions by wire bonding.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have the base include wiring material for electric connection to the outside, the wiring material having connection portions electrically connected to the electrode pads by wire bonding in order to be able to supply driving current to the conductive element and drive the mirror structure.

Regarding claims 3 and 4, Esashi et al and Minamoto et al do not teach the base comprises a main substrate having the opening, and a rigid substrate fixed to the main substrate, and the wiring materials are formed on the rigid substrate.

It would have been obvious to one of ordinary skill in the art at the time of the invention to form the wiring materials on a rigid substrate fixed to the main substrate of the base in order to reduce the likelihood of the wiring materials breaking due to flexing.

Regarding claim 6, Minamoto et al teaches the base further comprising a flexible substrate (Figure 27 reference 20) formed integrally with the rigid substrate.

Regarding claim 7, Minamoto et al teaches the base further comprising a flexible lead wire (wires on reference 20) connected to the wiring materials of the rigid substrate.

Regarding claims 8 and 15, Esashi et al teaches the conductive element comprises a coil (page 10 lines 21 – 22) disposed along a peripheral edge of the movable plate (Figure 10).

Regarding claim 10, Minamoto et al teaches the driving means further comprises a yoke of magnetic material (reference 109), which cooperates with the magnetic field generating elements (reference 108) to constitute a magnetic circuit, and at least a part of the yoke is disposed in the vicinity of the first surface of the movable plate.

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Regarding claims 13 and 16, Esashi et al teaches the opening of the base has a size that does not intercept a light beam incident upon the mirror surface of a time when the movable plate is parallel to the base at an incidence angle of 45° over a full effective width of the mirror surface (Figure 14), and the magnetic field generating elements are located not to intercept a light beam incident upon the mirror surface of the time when the movable plate is parallel to the base at the incidence angle of 45° over the full effective width of the mirror surface (Figure 14).

Regarding claims 14 and 17, Esashi et al teaches the magnetic field generating elements are located interposing the conductive element formed on the first surface of the movable plate, and a mirror surface effective width w_m , interval w_p of the magnetic field generating elements, base opening width w_b , height h_p of the magnetic field generating elements with respect to the mirror surface, and height h_b of an upper surface of the base opening with respect to the mirror surface satisfy conditions: $w_p > w_m + 2h_p$; and $w_b > w_m + 2h_b$ (Figure 11).

Regarding claim 15, Esashi et al teaches the driving means including permanent magnets (page 10 line 39) fixed on the base.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Esashi et al in view of Minamoto et al and further in view of McClelland et al (US 6,201,629).

Esashi et al and Minamoto et al teach an optical deflector as described above. Esashi et al and Minamoto et al do not teach the wiring materials including a ground wiring for grounding, and the ground wiring is electrically connected to the conductive main substrate.

McClelland et al teaches an optical deflector where the wiring materials include a ground wiring for grounding, and the ground wiring is electrically connected to the main substrate (column 13 lines 42 – 43). It would have been obvious to one of ordinary skill in the art at the

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time of the invention to use the ground wiring of McClelland et al in the optical deflector of Esashi et al in view of Minamoto et al in order to reduce static charge build-up.

Conclusion

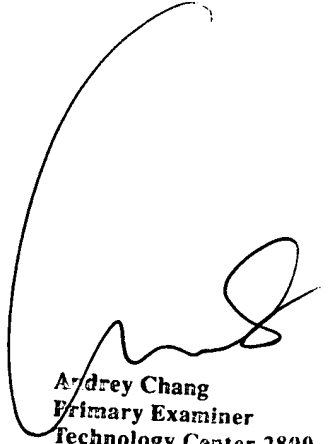
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise S Allen whose telephone number is (703) 305-7407. The examiner can normally be reached on Monday - Friday, 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A Dunn can be reached on (703) 305-0024. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

Denise S Allen
Examiner
Art Unit 2872


dsa


Audrey Chang
Primary Examiner
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